

Wisconsin Observation Well Network



Wisconsin Observation Well Network (WOWN)

- Since 1946 the WOWN has been a cooperative project between the UW-Extension Wisconsin Geological and Natural History Survey and the US Geological Survey



What is the WOWN?

- What can be observed?
 - Water level and water characteristics
- Four dimensions of an observation
 - Location
 - Depth
 - Time

What is the WOWN?

- Locations of observations
 - Just over a hundred wells located around the state



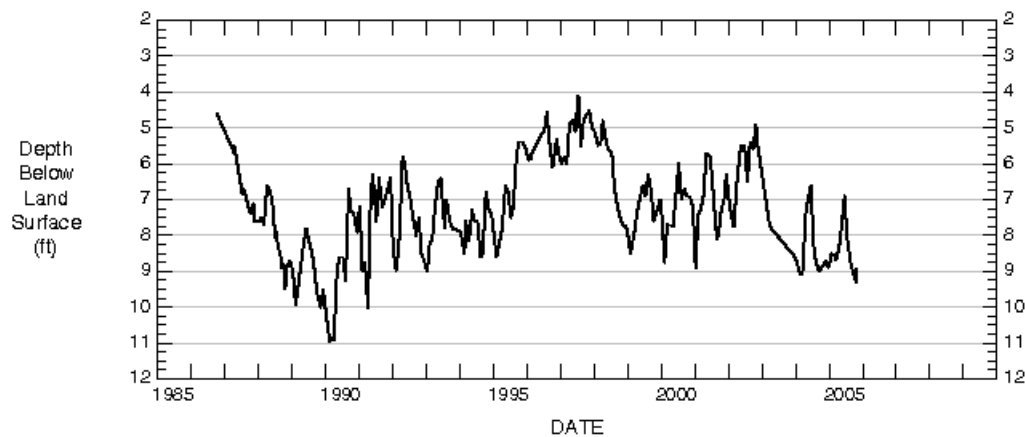
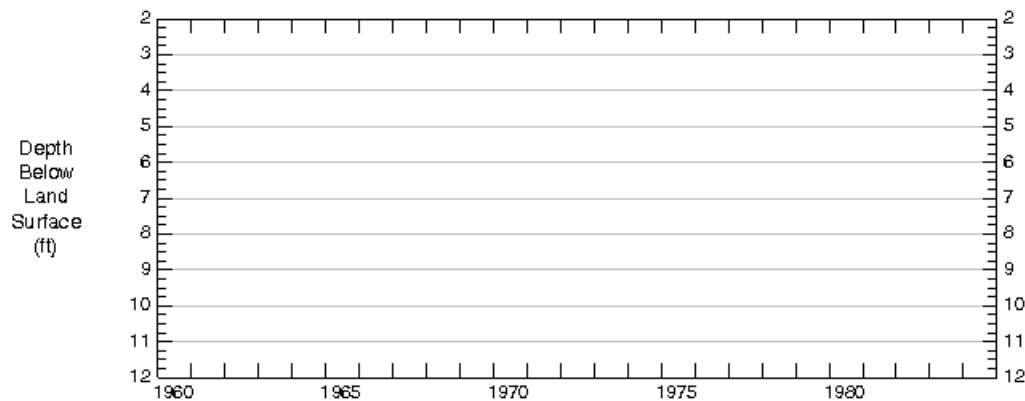
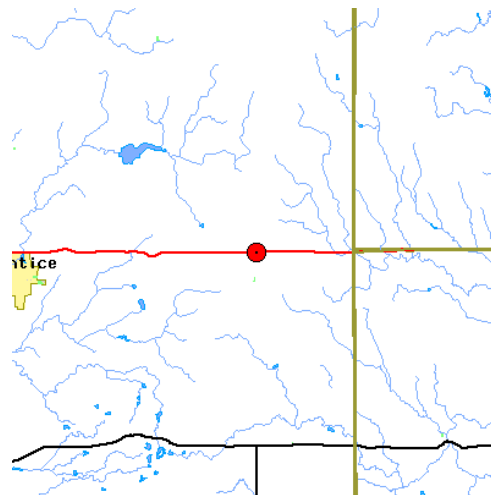
What is the WOWN?

- Depths of observations
 - Tens of feet to hundreds of feet
 - Sand and Gravel aquifer
 - Silurian Dolomite aquifer
 - Galena-Plattville aquifer
 - Sandstone aquifer
 - Precambrian aquifer



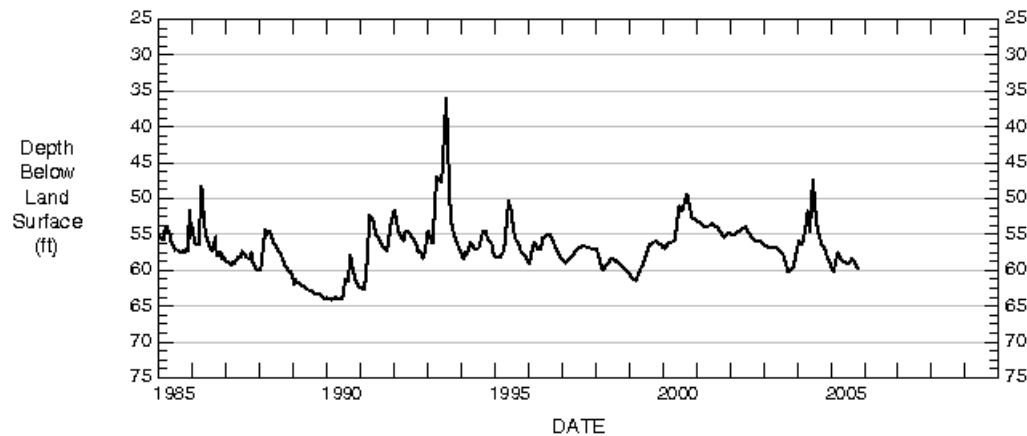
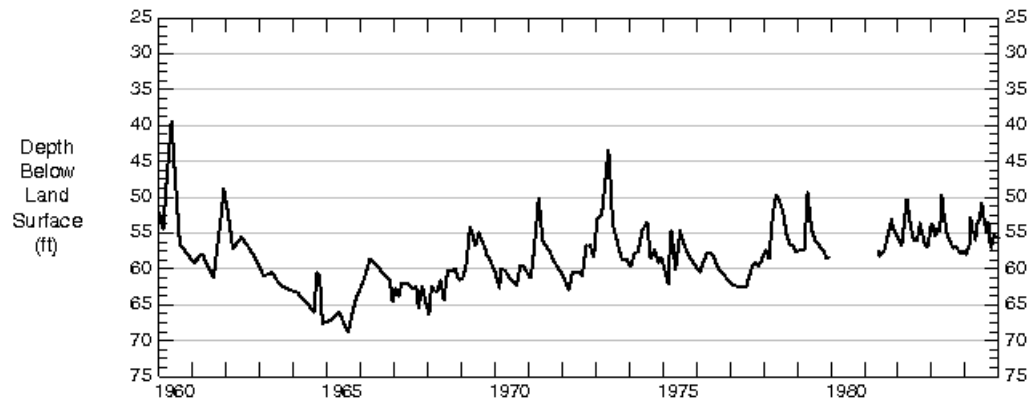
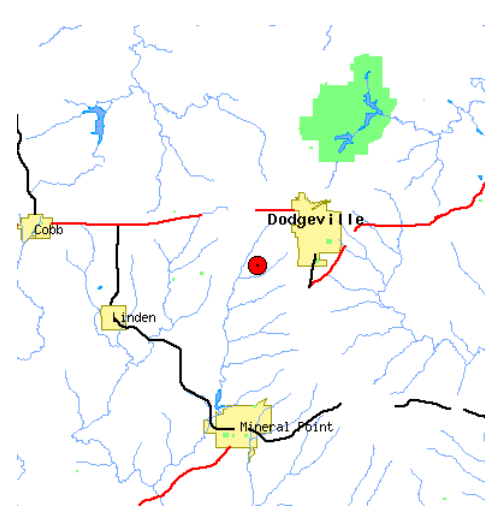
PR-0065

Sand and Gravel



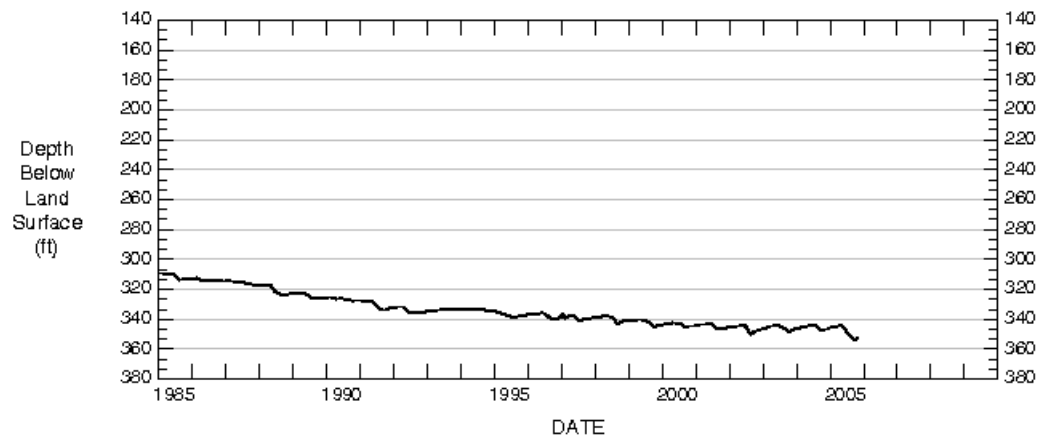
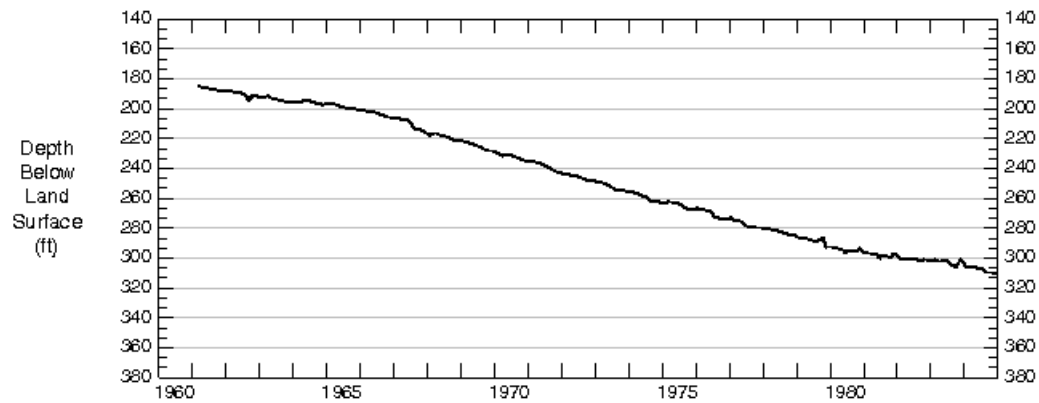
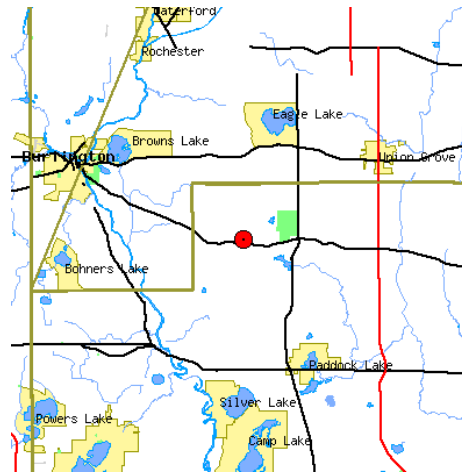
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Galena Platteville



KE-0021

Sandstone



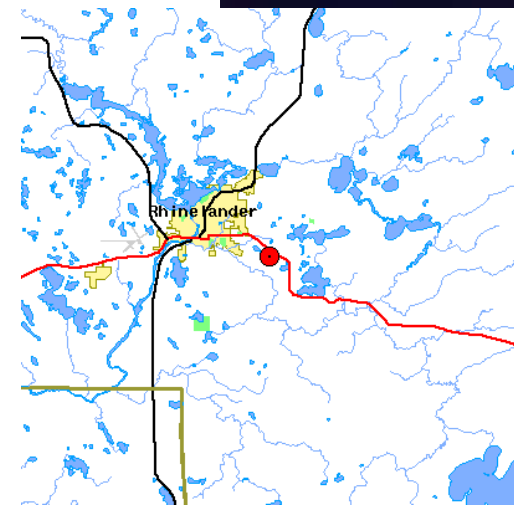
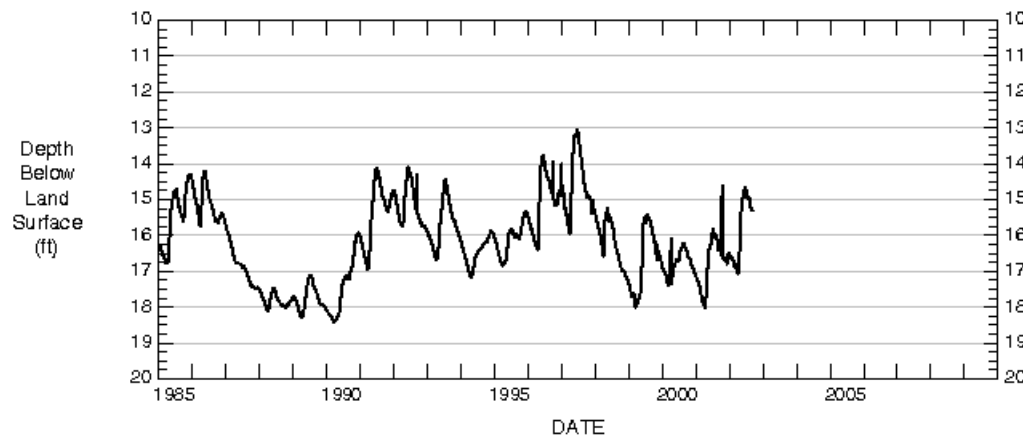
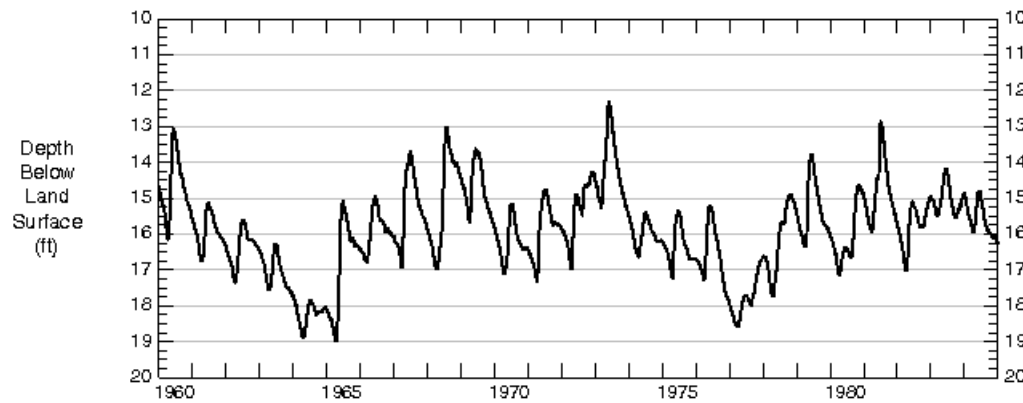
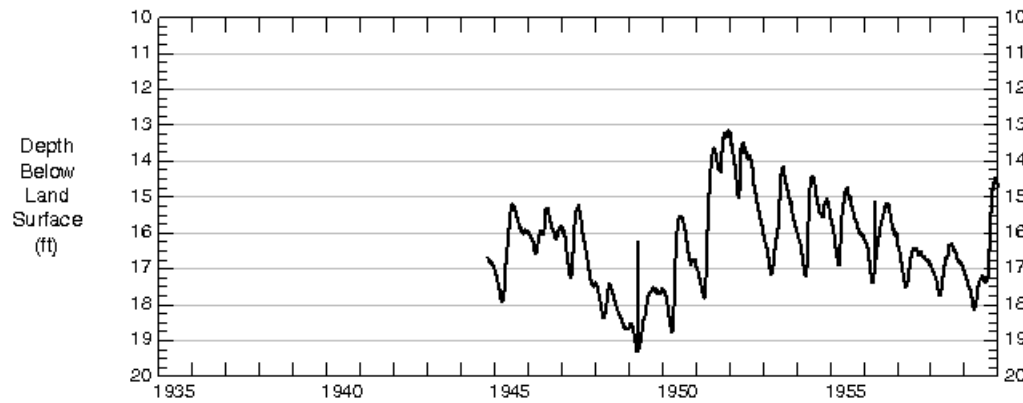
What is the WOWN?

- Time period of observations
 - Up to 70 years
 - Many between 40 and 60 years

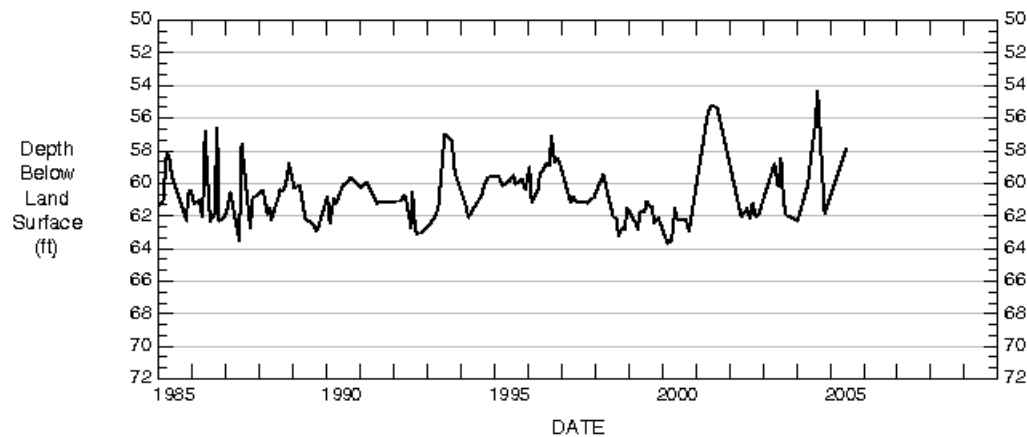
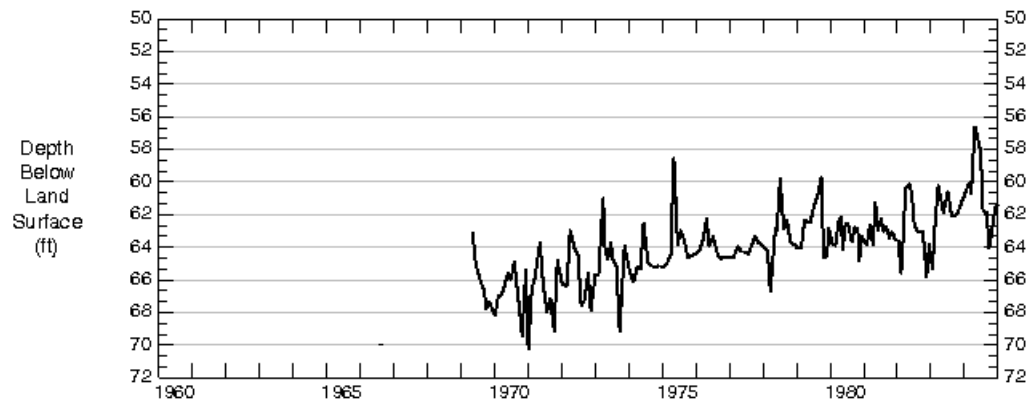
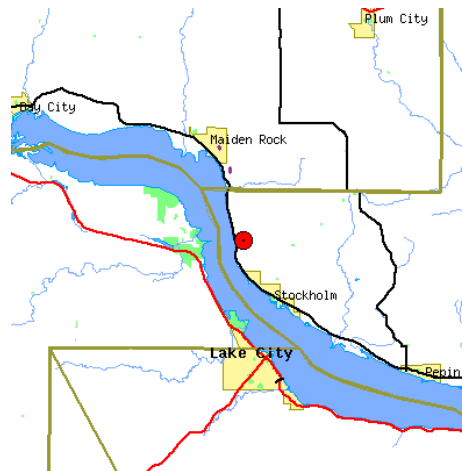


ON-0024

Revised:
Nov 17, 2005



PP-0039



Importance of observations

- Evaluate changes in ground-water recharge and storage
- Determine surface/ground-water system relations
- Monitor for drought and flood conditions
- Establish baseline for environmental studies (wetlands, ecosystems, habitat, climate)
- Monitor regional effects of ground-water development
- Develop ground-water-flow models
- Design, implement, and monitor the effectiveness of ground-water management and protection programs

Essential Components

(Taylor and Alley, 2003, USGS Circular 1217)

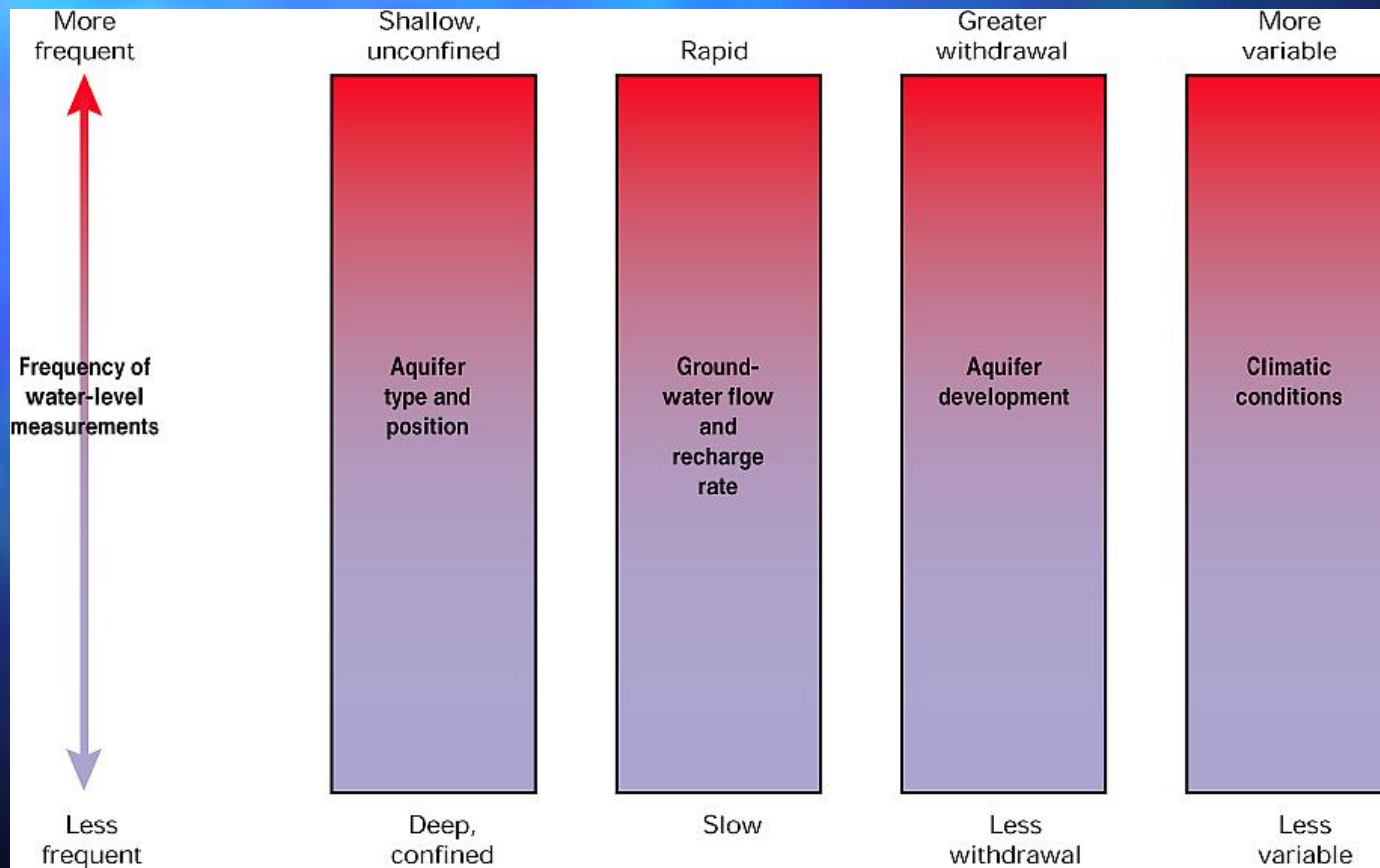
- Selection of observation wells
- Determination of measurement frequency
- Quality assurance
- Data reporting

Selection of observation wells

Ideally - Network should provide representative data on various topographic, geologic, climatic and land – use environments.

Reality - Most wells in network were chosen because of availability (wells are expensive to drill).

Determination of Measurement Frequency - *Ideally*



Determination of Measurement Frequency - *Reality*

- Measurement frequency is often based on the distance the well is from Madison or if an observer is available.
- Funding often determines frequency of measurement – *observer vs. staff*.
- About half of the observations are conducted by volunteer observers - only 16 observers are paid.

Quality assurance

- Data entry and databases
- Observer training
- Observation well maintenance

Data reporting

- USGS, Wisconsin annual report – selected wells; brief description of status of water table during the year
- Databases – NWIS; USGS WI website



District Access
[Water Resources](#)

Data Category:

Ground Water

Geographic Area:

Wisconsin

GO

Ground-Water Data for Wisconsin

Real-time

Data transmitted from selected ground-water sites.

Site information

Descriptive site information including latitude, longitude, well depth, and site use.

Levels

Depth to water or water-surface elevation in wells.

Introduction

The Ground-Water database contains ground-water site inventory, ground-water level data, and water-quality data.

The [ground-water site inventory](#) consists of more than 850,000 records of wells, springs, test holes, tunnels, drains, and excavations in the United States. Available site descriptive information includes well location information such as latitude and longitude, well depth, and aquifer.

The USGS annually monitors ground-water levels in thousands of wells in the United States. Ground-water level data are collected and stored as either discrete [ground-water level measurements](#) or as continuous record. Data from some of the continuous record stations are relayed to USGS offices nationwide through telephone lines or by satellite transmissions providing access to [realtime ground-water data](#).

Questions about data
Feedback on this website

gs-w-wi_NWISWeb_Data_Inquiries@usgs.gov
gs-w-wi_NWISWeb_Maintainer@usgs.gov

Ground-Water Data for Wisconsin
<http://waterdata.usgs.gov/wi/nwis/gw?>

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[Explanation of terms](#)

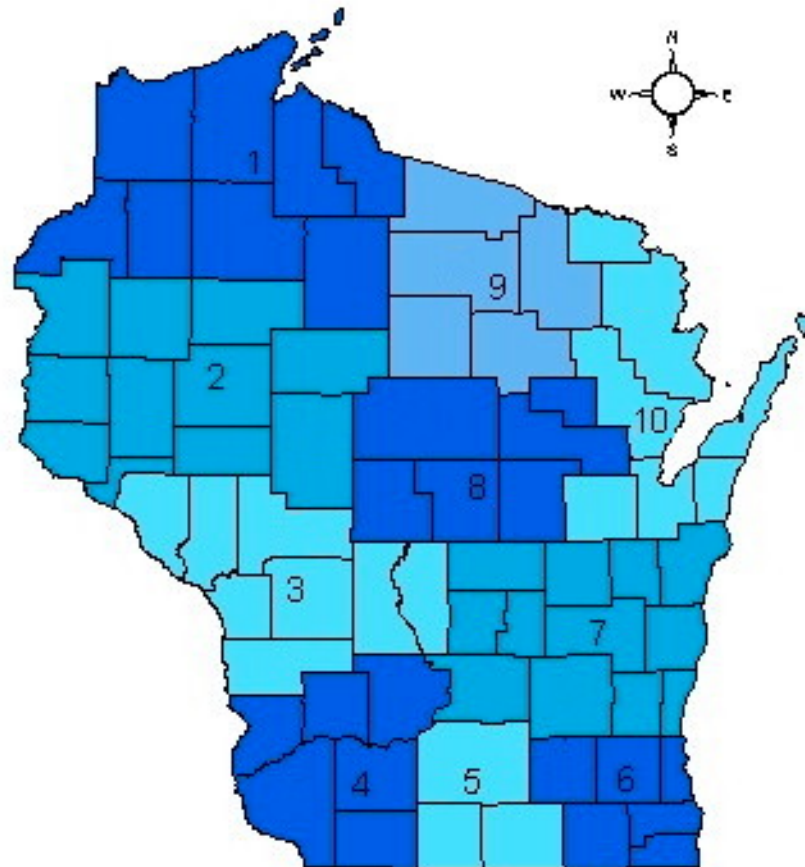
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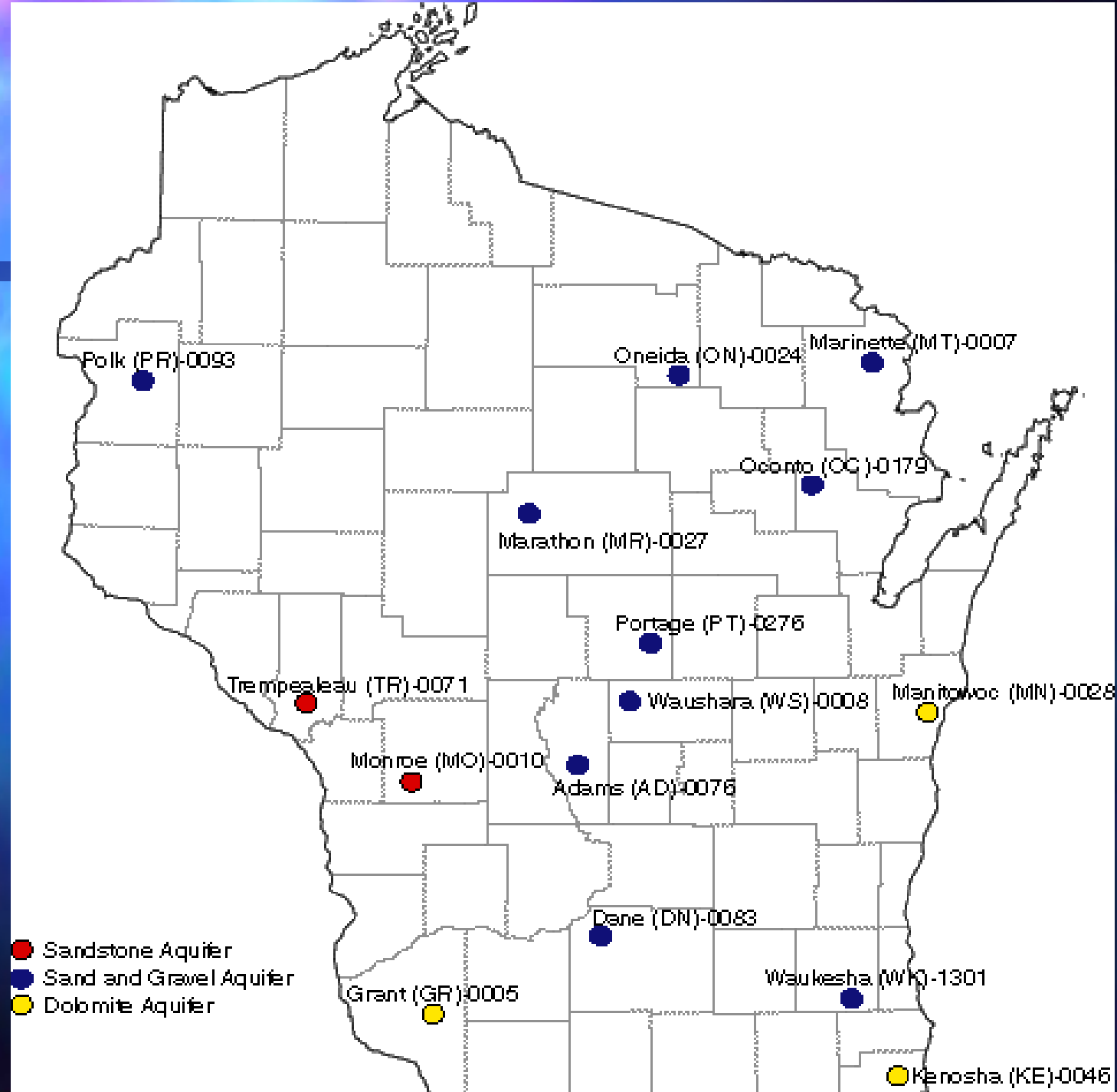


Groundwater Observation Network

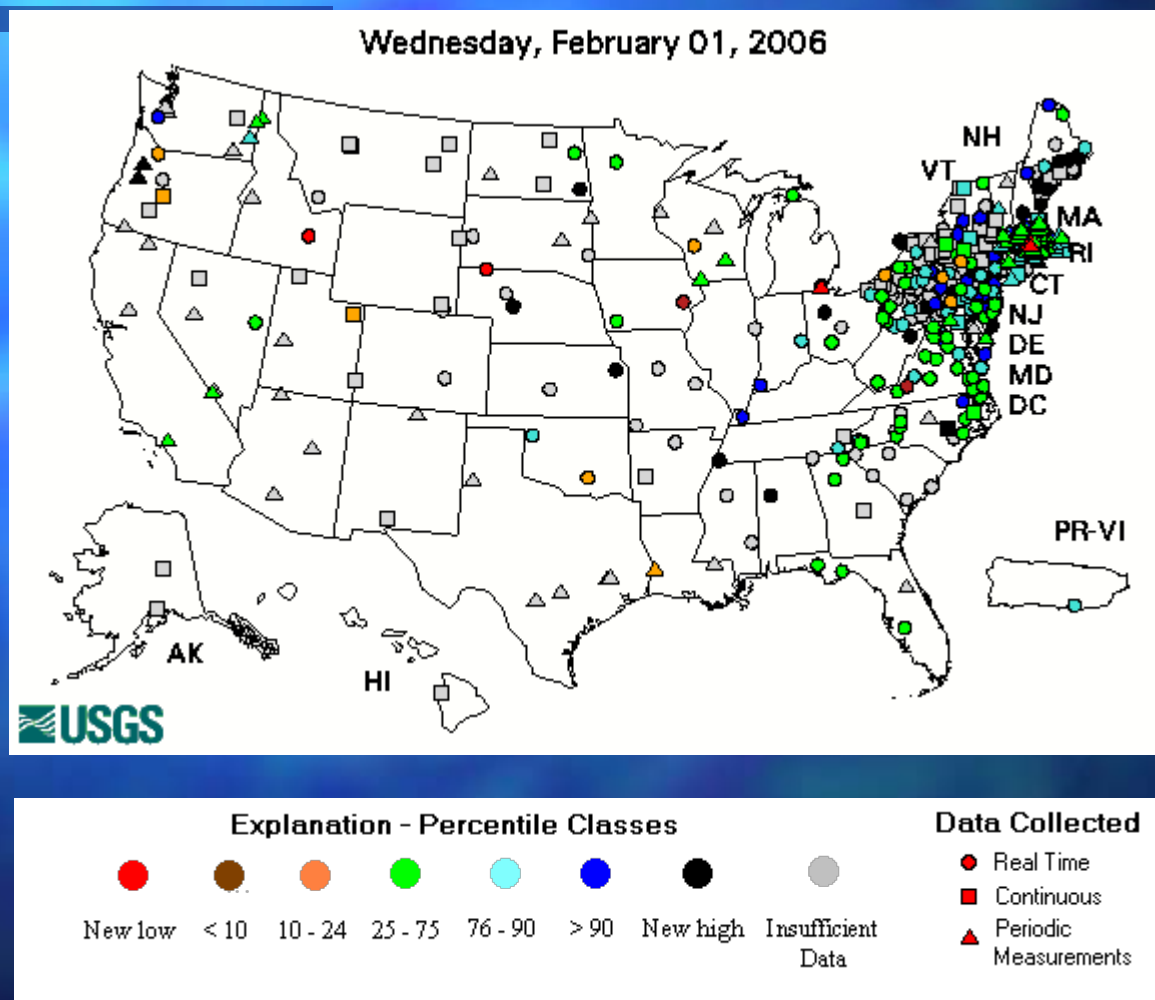
Current Watertable

Historic Water Level





Ground-Water Climate Response Network



Recommendations

- Review of the network should include assigning an objective to each well.
- Wells lacking construction information should be addressed.
- Conduct regular maintenance and QA (slug every 5 years).
- Adequate monitoring of regional cones of depression require additional observation wells.
- For each GMU - adequate distribution of observation wells to determine trends and establish a baseline in ground-water levels.
- The possibility of expanding into ground-water quality monitoring should be discussed by the appropriate agencies.

Final Thoughts

- GWMA based on drawdown of ground-water levels; drawdown based largely on simulations, not specific data
- Confidence in ground-water-flow simulations is proportional to the quality and quantity of ground-water-level data
- Transient management of water resources (SEWRPC example) based on transient data (trends)

Final Thoughts

- Big Picture Issues
 - Ground-water recharge
 - Interaction of surface and ground water
 - Comprehensive planning
 - Climate variability
- The existing State/Federal cooperative program is uniquely well-positioned to:
 - Provide long-term collection and management of ground-water-level data
 - Provide ground-water data collection in critical locations for evolving water-management needs